REMARKS

The Office Action mailed on October 24, 2001 has been received and reviewed. Claims 1 through 56 are currently pending in the application. Claims 1 through 37 and 52 through 56 stand rejected. Claims 38 through 51 have been withdrawn from consideration. Claims 31 and 32 have been objected to as being dependent upon rejected base claims, but the indication of allowable subject matter in such claims is noted with appreciation. Applicants have amended claims 23, 35, and 52.

Reconsideration of the above-referenced application is respectfully requested.

Preliminary Amendment

A Preliminary Amendment was filed in the above-referenced application on January 3, 2001, but the filing of the Preliminary Amendment was not acknowledged by the Office in either the outstanding Office Action or in the Office Action mailed on July 19, 2001. Should the Preliminary Amendment have failed for some reason to have been entered in the Office file, the undersigned attorney will be happy to have a true copy thereof hand-delivered to the Examiner.

Objections to the Specification

In response to the Examiner's request in the outstanding Office Action (page 2, lines 11-12), specific paragraphs in the specification have been amended as shown in the revised paragraphs submitted hereinabove, correcting minor editorial problems without the addition of any new matter. Among other things, as noted in the version with markings, specific reference to wire bonds 68 is now made in the discussion of Fig. 11.

As to the objection of sub-layer 51 not being depicted in Fig. 11 (*Id.*, page 2, line 7), the Office is kindly reminded that layer 50 can be made out of superimposed sub-layers 51 (*cf.* Paragraphs 48 and 51 of the presently amended specification). Thus, Fig. 9 illustrates a substrate with one sub-layer 51 applied thereto and Fig. 10 shows a substrate with a layer 50 instead.

Claim Objections Under 35 U.S.C. § 112, Second Paragraph

Claims 2, 18, and 35 stand objected to under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to the objection to claim 2, Applicants respectfully submit that reading of claim 2, together with and supported by the disclosure of the present application, is sufficient to particularly point out and distinctly claim the subject matter of the instant invention being claimed therein. "No claim may be read apart from and independent of the supporting disclosure on which it is based." *In re Cohn*, 438 F.2d 989, 169 USPQ 95 (CCPA 1971). See also *In re Hammack*, 427 F.2d 1378, 166 USPQ 204 (CCPA 1970). The differences between "unconsolidated state" and "liquid state" have been explained in the specification section of the application. Particularly, in paragraph 41 of the specification one finds that:

> while the invention is described in terms of a liquid material polymerizable to a semi-solid and/or solid, the process may be varied to use a powdered material, for example. The term 'unconsolidated' will be used herein to denote the unpolymerized material, which becomes 'altered' or 'consolidated' by the laser radiation to at least a semi-solid state.

Claim 2 recites, "forming . . . at least a first layer of . . . protective material in [an] unconsolidated state comprises forming said at least a first layer with said protective material being in a liquid state." Thus, based on the specification of the above-referenced application and the language of claim 2, Applicants respectfully submit that claim 2 is definite and does not fail to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Therefore, Applicants respectfully request that the Office reconsider the objection to claim 2.

As to the objection to claim 18, Applicants respectfully submit that there is not a need to correct the dependency therein. Dependent claim 15 further limits dependent claim 13 by subjecting the protective material in a semisolid state to a secondary curing for further solidification. Claim 17, depending from claim 15, recites the singulation of the selected dice from the wafer. Finally, claim 18, which depends from claim 17, adds the limitation that the singulation recited in claim 17 be effected before the secondary curing recited by claim 15. Therefore, Applicants respectfully request that the Office reconsider the objection to claim 18.

As to the objection to claim 35, Applicants respectfully submit that the indefiniteness of the term "for controlling said subjecting" has been corrected. Presently amended claim 35 now reads: "the method of claim 34, wherein said storing data comprises merging said data for at least one physical parameter for said at least one selected die with data for controlling said subjecting at least one selected portion of said liquid resin over said active surface of said at least one selected die to a discrete beam of focused radiation." Therefore, Applicants respectfully request that the Office reconsider the objection to claim 35.

In view of the foregoing, it is respectfully requested that the 35 U.S.C. § 112, second paragraph, rejections of claims 2, 18, and 35 be withdrawn.

35 U.S.C. § 103(a) Obviousness Rejections

(A) Applicable Authority

The basic requirements of a *prima facie* case of obviousness are summarized in MPEP §2143 through §2143.03, *i.e.*, in order "to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success in combining the references. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the expectation of success must both be found in the prior art, and not based on Applicants' disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Further, in establishing a *prima facie* case of obviousness the initial burden is placed on the examiner. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). See also MPEP § 706.02(j) and § 2142.

The Supreme Court has established the standard of patentability to be applied in obviousness rejections in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). This standard has been summarized in MPEP § 2141 into four factual inquires including "(A)

determining of the scope and contents of the prior art; (B) ascertaining the differences between the prior art and the claims in issue; (C) resolving the level of ordinary skill in the pertinent art; and (D) evaluating evidence of secondary considerations." It should be noted that, when applying the required patentability standards of *Graham,* the basic considerations which apply to obviousness rejections based on 35 U.S.C. § 103 should include the following principles of patent law: "(A) the claimed invention must be considered as a whole; (B) the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; (C) the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and (D) reasonable expectation of success is the standard with which obviousness is determined." *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

(B) Obviousness rejections in view of U.S. Patent No. 6,268,655 to Farnworth et al.

As set forth in the outstanding Office Action and further discussed herein below, several of the obviousness rejections were based at least in part on U.S. Patent No. 6,268,655 to Farnworth et al. (hereinafter "Farnworth"). Applicants respectfully submit that, under 35 U.S.C. § 103(c), the obviousness rejections based on Farnworth are improper. 35 U.S.C. § 103(c) provides:

> Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

The above-referenced application, which is owned by Micron Technology, Inc., as indicated by the Assignment recorded by the Patent Office on June 8, 2000, at reel/frame: 010870/0153, has an effective filing date of June 8, 2000. Farnworth, which was filed on September 30, 1999, but did not issue until July 31, 2001, only qualifies as prior art under 35 U.S.C. § 102(e) and indicates Micron Technology, Inc. to be the assignee thereof. Thus, under the provisions of 35 U.S.C. § 103(c), Farnworth cannot be used in a 35 U.S.C. § 103(a) rejection of any of the claims of the above-referenced application.

Therefore, withdrawal of the 35 U.S.C. § 103(a) rejections that are at least partially based on Farnworth is respectfully requested.

(C) Obviousness Rejection Based on U.S. Patent No. 6,284,563 to Fjelstad in view of U.S. Patent No. 6,268,655 to Farnworth et al. and in further view of U.S. Patent No. 4,575,330 to Hull

Claims 1 through 23, 33 through 37, and 52 through 56 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fjelstad (U.S. Patent No. 6,284,563, hereinafter "Fjelstad") in view of Farnworth and in further view of Hull (U.S. Patent No. 4,575,330, hereinafter "Hull").

Applicants respectfully submit that, besides the inappropriateness of using Farnworth to find obviousness in the instant invention under 35 U.S.C. § 103(a) as explained hereinabove in Subsection (B), as it will be further substantiated herein below, Fjelstad and Hull, individually or in any combination thereof, do not support a *prima facie* case of obviousness of the present invention. As a matter of organization, the inventions of Fjelstad and Hull will first be summarized followed by argument corroborating the conclusion that the burden of a *prima facie* case of obviousness has not been met.

Fjelstad relates to a process of creating a compliant chip package on the face surface of a single die, multiple die, or undiced silicon wafer which may be subsequently diced into individual packaged chips. (Fjelstad, col. 8, lines 13-19). A dielectric passivation layer 130 is deposited or adhered onto the face surface 120 of a single semiconductor chip 100, covering the face surface 120 while leaving the chip contacts 110 exposed so that a bond ribbon may be plated thereon. Several preferred methods to form the passivation layer 130 are disclosed including: (*i*) spinning onto and building up passivation material to a planar sheet-like form to be laminated to the face surface 120 using adhesives; (*ii*) exposing and developing photo-imagable material deposited on the face surface 120 and later removing the leftover material from the unexposed areas by use of a pulse of directed energy; and (*iii*) laminating the chip 100 with a continuous dielectric sheet already having set contact holes. Next, a compliant layer 140, which is stenciled, screened or transfer molded using a curable liquid, is deposited or laminated onto the exposed surface of the passivation layer 130. A plating seed layer 150 is next deposited atop the aforementioned assembly, typically using a sputtering operation, and a photoresist 160 is then applied to the exposed top surfaces of the assembly and exposed and developed such that

bond ribbons 170 may be plated within defined areas to form conductive paths electrically connecting the chip contacts 110 near a first end region of the ribbons 170 to terminals 175 comprising the second end region of the ribbons 170. A dielectric layer 180 is then deposited or laminated over the top of the assembly so that only the terminals 175 are exposed. The dielectric layer may be comprised of a screened, exposed and developed or laminated sheet of photo resist material or may be comprised of paralene, epoxy resin, polyimide resin, or fluoropolymer, which is deposited or laminated on to the assembly. The terminals 175 may then be electrically connected to a circuitized substrate, such as a printed wiring board. (*Id.*, col. 8, line 20, to col. 10, line 44).

Alternate embodiments are disclosed which teach (*i*) different methods to deposit encapsulant materials to the face of the substrate, including the use of a fixture (*Id.*, col. 11, lines 23-27) or a machine (*Id.*, col. 11, lines 30-35) to flow a liquid material; (*ii*) the use of a conductive material to form ribbons 170 by sputtering or depositing it across the exposed surface of the assembly and then etching the deposited material using industry standard photolithographic techniques (*Id.*, col. 11, lines 42-60); (*iii*) the use of molds and curable liquids for depositing the different layers in the assembly (*Id.*, col. 12, lines 24-60); and (*iv*) the use of one or more non-selective deposition techniques, such as electroless plating or sputtering of a conductive layer over the assembly, to make bond ribbons 170 with or without an additional non-selective electroplating step, followed by selective etching of the conductive layer to provide electrically isolated bond ribbons (*Id.*, col. 12, line 37, to col. 13, line 27).

Turning now to Hull, his invention relates generally to an apparatus for forming three-dimensional objects from a fluid medium by use of computer-generated graphics in combination with stereolithography to simultaneously execute computer aided design (CAD) and computer aided manufacturing (CAM) in prototyping three-dimensional objects directly from computer instructions. The invention can be applied for the purposes of sculpturing models and prototypes in a design phase of product development, or as a manufacturing system, or even as a pure art form. (Hull, col. 2, lines 24-36). A container 21 is filled with a UV curable liquid 22 to provide a designated working surface 23. A programmable source of ultraviolet light 26 produces a spot of ultraviolet light 27 in the plane of surface 23 movable across the surface 23 by the motion of mirrors or other optical or mechanical elements that are a part of light source 26. The position of the spot 27 on surface 23 is controlled by a computer or other programming device 28. A

movable elevator platform 29 inside container 21 can be moved up and down selectively. The surface of the UV curable liquid 22 is maintained at a constant level in the container 21, and the spot of UV light 27, of sufficient intensity to cure the liquid and convert it to a solid material, is moved across the working surface 23 in a programmed manner. As the liquid 22 cures and solid material forms, the elevator platform 29 that was initially just below surface 23 is moved down from the surface in a programmed manner by any suitable actuator. In this way, the solid material that was initially formed is taken below surface 23 and new liquid 22 flows across the surface 23. A portion of this new liquid is, in turn, converted to solid material by the programmed UV light spot 27, and the new material adhesively connects to the material below it. This process is continued until the entire three-dimensional object 30 is formed. After the three-dimensional object 30 has been formed, the elevator platform 29 is raised and the object is removed from the platform. Typically, the object is then ultrasonically rinsed in a solvent, such as acetone, that dissolves the liquid state of the uncured fluid medium and not the cured solid-state medium. The object 30 is then placed under an intense ultraviolet floodlight to complete the curing process. (*Id.*, col. 6, line 26 – Col. 9, line 31).

As to the obviousness rejections of independent claims 1, 12, 33, and 52 based on Fjelstad in further view of Hull, Applicants respectfully submit that a *prima facie* case of obviousness cannot be supported by these two prior art references.

First, it is respectfully submitted that one of ordinary skill in the art would not have been motivated by the teachings of Fjelstad, Hull, or the knowledge that was generally available in the art before the filing date of the above-referenced application.

Hull teaches an apparatus for forming three-dimensional objects from a fluid medium by use of computer-generated graphics in combination with stereolithography to simultaneously execute computer aided design (CAD) and computer aided manufacturing (CAM) in producing three-dimensional prototypes directly from computer instructions. Hull is silent as to any manufacturing applications involving mass production of semiconductor device features or components. Fjelstad relates to methods for mass-producing integrated circuits and the like. Further, a person of ordinary skill in the art of integrated circuit devices and the like, as in the field with which the present invention and Fjelstad are concerned, would not reasonably be expected to be familiar with and motivated to use a prototyping technology, such as that described in Hyll, wherein three-dimensional prototypes are formed from a fluid medium by use

of computer-generated graphics in combination with stereolithography to simultaneously execute computer aided design (CAD) and computer aided manufacturing (CAM) in producing three-dimensional prototypes. The Office is kindly reminded that, in resolving the level of ordinary skill in the art, one "must ascertain what would have been obvious to one of ordinary skill in the art at the time the invention was made, and not to [the PTO Office,] the inventor, a judge, a layman, those skilled in remote arts, or to geniuses in the art at hand." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 218 USPQ 865 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1043 (1984). See also *Oetiker*, supra, disqualifying a reference that was not within the field of an applicant's endeavor and was not reasonably pertinent to the particular problem with which the inventor was concerned because it had not been shown that a person of ordinary skill, seeking to solve a problem in one art, would reasonably be expected or motivated to look for a solution in an inapplicable art.

Combining Fjelstad and Hull to find obviousness in the invention recited in independent claims 1, 12, 33, and 52, neglecting the requirements of *Ellis*, *Oetiker*, and *Deminski*, supra, can only be justified by use of the benefit of impermissible hindsight vision afforded by the Applicant's claimed invention—a procedure contrary to current principles of patent law (cf. *Hodosh*, supra).

Second, it is respectfully submitted that Fjelstad and Hull, taken alone or in combination, do not teach or suggest each and every element of several of the rejected claims.

As to independent claim 33, Fjelstad does not teach or suggest a method of forming a protective layer on a selected portion of an active surface of a semiconductor dice of a wafer that includes, among other things, "recognizing a location and orientation of at least one selected die of the wafer and bond pads on the active surface of the selected die." Rather, in Fjelstad the semiconductor wafer on which fabrication occurs would be aligned based on the locations of fiducial marks thereon, not on a recognized location or orientation of at least one selected die. In Hull, fabrication fabrication proceeds based on the location of a previously defined material layer and, thus, is built-in; i.e., there is no need to recognize an orientation or a location of a structure on which fabrication is to be effected.

Also, as to presently amended independent claim 52, neither Fjelstad nor Hull teaches or suggests a method for securing a component of a semiconductor device assembly to another component of the semiconductor device assembly that includes, among other things:

(*i*) providing the component, the component including at least one support structure on a portion of a surface thereof, said at least one support structure comprising a plurality of superimposed, contiguous, mutually adhered layers of material, at least an outermost layer of said plurality of layers comprising an adhesive material; (*ii*) aligning the component with the another component; and (*iii*) securing the component to the another component with said adhesive material.

Claims 2 through 11 are allowable, among other reasons, as depending either directly or indirectly from claim 1, which is allowable.

Claims 13 through 23 are allowable, among other reasons, as depending either directly or indirectly from claim 12, which is allowable.

Claims 34 through 37 are allowable, among other reasons, as depending either directly or indirectly from claim 33, which is allowable.

Claim 34 is further allowable since neither Fjelstad nor Hull teaches or suggests storing data that includes at least one physical parameter of a structure or feature on which another structure is to be fabricated. Nor does Fjelstad or Hull teach or suggest that such stored data may be used in cooperation with a machine vision system to recognize a location and orientation of the structure or feature on which fabrication is to be effected to control such fabrication.

Claim 35 is additionally allowable because neither Fjelstad nor Hull teaches or suggests that data including at least one physical parameter of a structure or feature on which another structure is to be fabricated may be merged with data for controlling fabrication of the other structure.

Claims 53 through 56 are allowable, among other reasons, as depending either directly or indirectly from claim 52, which is allowable.

Claim 54 is also allowable because neither Fjelstad or Hull, individually or in any combination thereof, teach or suggest, as to claim 54, "the method of claim 53, wherein said securing comprises heating at least portions of said thermoplastic material to at least soften said thermoplastic material . . ."

Claim 55, which depends from claim 54, is additionally allowable since neither Fjelstad nor Hull, taken either alone or in combination, teaches or suggests "heating at least one conductive structure . . . to secure said at least one conductive structure to a contact of [another] component . . .", thereby securing two components to one another.

Therefore, Applicants respectfully request withdrawal of the obviousness rejections under 35 U.S.C. § 103 of claims 1 through 23, 33 through 37, and 52 through 56.

(D) Obviousness Rejection Based on U.S. Patent No. 6,284,563 to Fjelstad in view of U.S. Patent No. 6,268,655 to Farnworth et al. and U.S. Patent No. 4,575,330 to Hull and in further view of U.S. Patent No. 5,897,338 to Kaldenberg.

Claims 24 through 30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fjelstad in view of Farnworth and Hull and further in view of Kaldenberg (U.S. Patent No. 5,897,338, hereinafter "Kaldenberg").

Kaldenberg relates to a method for encapsulating an integrated semi-conductor circuit (die) comprising the steps of (*i*) mounting the semi-conductor circuit onto the surface of a lead frame; (*ii*) attaching connecting wires between the contact surfaces of the semi-conductor circuit and selected parts of the lead frame; and (*iii*) producing a plastic housing by means of a mold that at least encapsulates the semi-conductor circuit, the support surface, the bonding wires, and part of the lead frame. (Kaldenberg, col. 1, lines 6-16). This encapsulation around the integrated semi-conductor circuit, which comprises optical-electronic components, is such that the resulting housing should have a cavity that gives an open connection between the outside world and the active area on the die. If this cavity should be closed, it should be closed with a window that is opaque for radiation (both in the visible part of the spectrum as well as in the infrared or ultraviolet parts of the spectrum). (*Id.*, col. 1, lines 26-34). A chip 12 is attached to the central section of a lead frame 10b by the bonding wires 14a and 14b between the various contact pins and the connecting surfaces on the chip. In the disclosed embodiment the mold comprises a bottom part 16 and a cover part 18. An opening 20 is made in the cover part 18 above the semi-conductor circuit 12. The opening 20 is closed by means of an extending part 22 with a cross-sectional shape corresponding to the shape of the opening 20. Preceding the insertion of the part 22 a certain amount of heat resistant deformable material 23, in the form of a ring or a continuous layer, is applied to the underside of part 22. Preferably the deformable material consists of a gel, especially a silicon gel. Thereafter an epoxy or resin 24 is injected in the free space in the mould to create the encapsulation. After at least partly hardening of the now encapsulated semi-conductor circuit, part 22 and the deformable material 23 are removed out of the mould, resulting in a semi-conductor circuit that is partly encapsulated with a part of its

upper surface still left free. Due to the shape of part 22, the resulting opening above chip has a stepwise shape suitable for mounting a window 26 by using a suitable adhesive 28. (*Id.*, col. 3, lines 9-61).

The discussion presented hereinabove in Subsection (B), as to the appropriateness of using Farnworth as a 35 U.S.C. §103 reference, is also applicable in this subsection for the combination of Fjelstad, Hull, Kaldenberg, and Farnworth to support a finding of obviousness of claims 24 through 30.

As to the obviousness rejections of claim 24 based on Fjelstad in view of Hull and in further view of Kaldenberg, Applicants respectfully submit that a *prima facie* case of obviousness cannot be supported by these three prior art references because there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the unrelated arts of semiconductor devices (the art related to Fjelstad and Kaldenberg) and stereolithographically generated prototypes (the art related to Hull), to modify the references or to combine the teachings thereof. *Vaeck*, supra. Kaldenberg's method of encapsulating a semi-conductor device by use of a plastic housing by means of a mold such that the resulting housing has a cavity that gives an open connection between the outside world and the active area on the die does not teach or suggest the claimed processes of the present invention in fabricating semiconductor device features or components. There is no motivation to combine Kaldenberg with Hull for the same reasons as explained hereinabove in support of the lack to combine Fjelstad and Hull: Kaldenberg teaches processes that are applicable in the mass production of semiconductor devices, while the teachings of Hull are limited to a method for forming prototypes.

Accordingly, it is respectfully submitted that, under 35 U.S.C. § 103(a), each of claims 24 through 30 is allowable over the combination of Fjelstad with Hull and Kaldenberg.

Therefore, Applicants respectfully request withdrawal of the obviousness rejections under 35 U.S.C. § 103 of claims 24 through 30.

Objections to Claims 31 and 32/Allowable Subject Matter

Claims 31 and 32 stand objected to as being dependent upon rejected base claims, but are indicated to contain allowable subject matter and would be allowable if placed in appropriate independent form. Applicants acknowledge this indication with appreciation, but respectfully

assert that the claims in their present form, along with all other claims presently under consideration, are in condition for allowance.

CONCLUSION

Claims 1 through 37 and 52 through 56 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

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Date: January 23, 2002
Enclosure: Version of Specification with Markings to Show Changes Made
Version of Claims with Markings to Show Changes Made

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

[0039] The data [is] are preferably formatted in an STL type computer file, STL being a standardized format employed by a majority of manufacturers of stereolithography equipment. Fortunately, the format has been adopted for use in many solid-modeling CAD programs, translation from another internal geometric database format is often unnecessary. In the particular case where the apparatus 10 is to be used for applying only a single layer 50 of uniform thickness, the program may be somewhat simplified.

[0044] Referring now to both FIGs. 1 and 2, data from the STL files resident in computer 12 is manipulated to form layer 50 one sub-layer 51 at a time on each die 52 or other substrate. Accordingly, where layer 50 is formed of a plurality of individually formed sub-layers 51, the data mathematically representing layer 50 [is] are divided into subsets, each subset representing a slice or sub-layer 51 of layer 50. This is effected by mathematically sectioning the 3-D CAD model into a plurality of horizontal sub-layers 51, a "stack" of such sub-layers 51 representing layer 50. Each slice or sub-layer 51 may be from about 0.0001 to about 0.0300 inch thick. As mentioned previously, a thinner slice promotes higher resolution by enabling better reproduction of fine vertical surface features of sub-layer 51. Where a "recoater" blade 32 is employed as described below, the interposition of base supports precludes inadvertent contact of blade 32 with the surface 54 of wafer 60 or the surface of another substrate.

[0053] A small portion of wafer 60 is shown in FIG. 3, having a plurality of rectangular dice 52A, 52B, 52C, 52D, 52E and 52F, etc., with die edges 48 separated by streets 44 in the X and Y directions. FIGS. 3 and 4 illustrate a die 52[B with bond pads 34 at an edge thereof,] prior to the formation of a protective layer 50 [on die 52] thereon. For the sake of simplicity, other details of the surface 56 of die 52 are not shown.

[0066] It should be noted that the laser treatment may be carried out to form a boundary 58 which adheres to the surface (e.g., die surface 56) of the substrate and the sub-layer 51 within the boundary is lightly cured to form a semi-solid "skin" which encloses liquid material 16. Trapped, unconsolidated material will [eventially] eventually cure due to the cross-linking initiated in the outwardly adjacent photopolymer. The cure of sub-layer 51 may be subsequently accelerated by broad-source UV radiation in a chamber, or by thermal cure in an

oven. In this manner, an extremely thick protective layer 50 may be formed in minimal time within apparatus 10.

[0067] As illustrated in FIG. 10, the method of the invention may be adapted to form layers 50 on dice 52 (e.g., LOC dice) already mounted on lead frames 66. In the example of FIG. 10, a series of dice 52 have active surfaces 64 secured to lead frames 66 of strip 80 and electrically connected thereto, such as by wire [bonding] bonds 68, thermocompression bonding, TAB bonding, or otherwise as known in the art. A layer 50 of semi-solid material formed from material 16 may be formed on any particular portion of the active surface 64 or back side 82 (including lead frame 66) of each die 52, for protection, insulation or other purpose. In the example of FIG. 10, a layer 50 of semi-solid material is to be formed on portions of the active surface 64 of a die 52 suspended from lead frame strip 80 and supported on platform 20. Layer 50 surrounds lead fingers of the lead frame 66 and provides attachment thereof to die 52. As already described, a film of liquid material 16 is formed atop the active surface 64 and lead frame 66. A narrow beam 28 of UV laser radiation is precisely scanned by stereolithographic means over particular areas to partially cure the material 16 to form a semi-solid layer 50. The lead frame strip 80 is then repositioned to place the next sequential die 52 in place for formation of layer 50. It should be noted that the process may be conducted without an underlying platform 20 provided that the die 52 and lead frame strip 80 are securely joined and a vertical position of the combination may be precisely attained and retained without underlying support.

[0068] In another variation, shown in the example of FIG. 11, a narrow sub-layer 51 defining an attachment 84 of semi-solid material may be first formed with the dice 52 positioned atop the lead frame strip 80, this layer formed adjacent the periphery of the dice 52 to join outer portions of the lead fingers to the dice. Attachment 84 may be formed by submerging the lead frame strip and die to a level providing the desired reinforcement member and partially curing by laser radiation. Following this step, the lead frame strip 80 may then be inverted and a layer 50 (not shown) applied to the active surface 64[/] of lead frame 66 side of the die 52, electrically connected thereto, such as by wire bonds 66, as indicated above.

IN THE CLAIMS:

23. (Amended) The method of claim 12, wherein said selectively altering comprises subjecting said at least [said] a portion of said at least one portion to a beam of radiation.

35. (Twice Amended) The method of claim 34, wherein said storing data comprises [data for] merging said data for at least one physical parameter for said at least one selected die with data for controlling said subjecting at least one selected portion of said liquid resin over said active surface of said at least one selected die to a discrete beam of focused radiation.

52. (Twice amended) A method for securing a component of a semiconductor device assembly to another component of the semiconductor device assembly, comprising:

providing the component, the component including at least one support structure on a portion of a surface thereof, said at least one support structure comprising a plurality of superimposed, contiguous, mutually adhered layers of material [on a surface thereof], at least an outermost layer of said plurality of layers comprising an adhesive material;

aligning the component with the another component; and

securing the component to the another component with said adhesive material.